

Figure 1

100

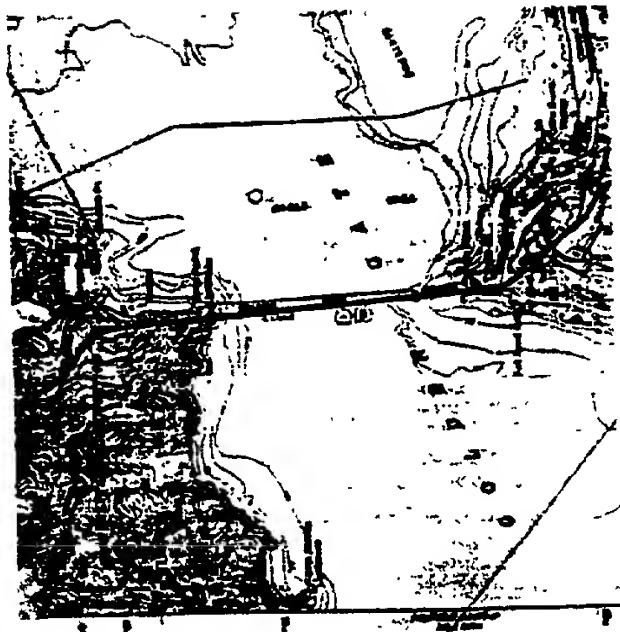
Click Mouse

150

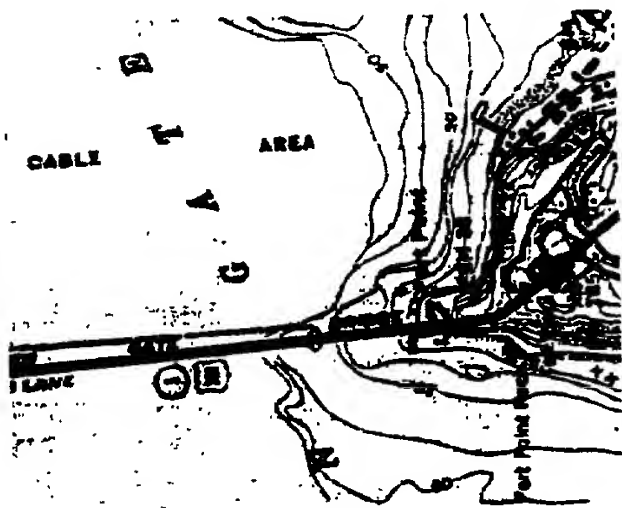
1 click

2 clicks

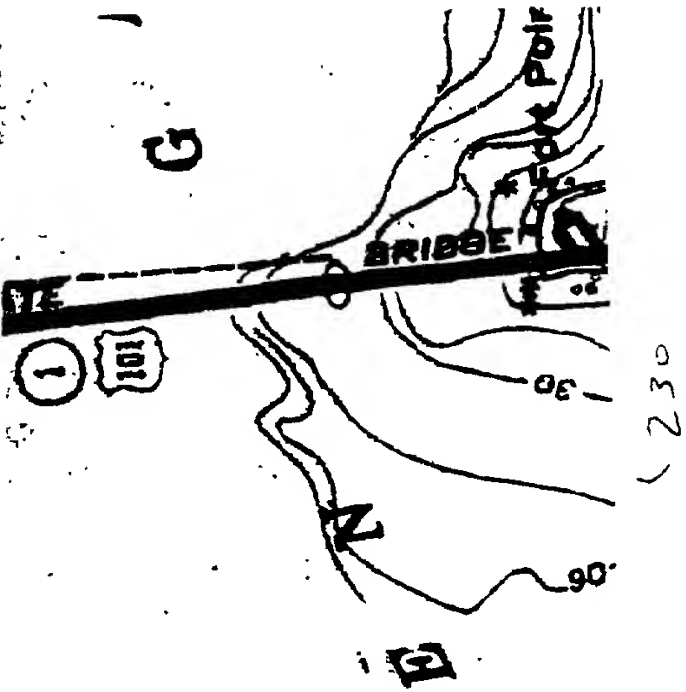
3 clicks



1210



1220



1230

Figure 2

Figure 3A

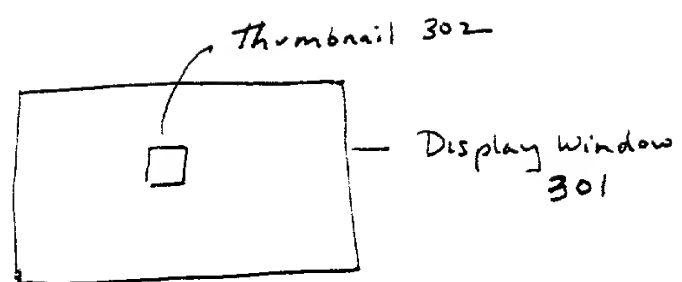


Figure 3B

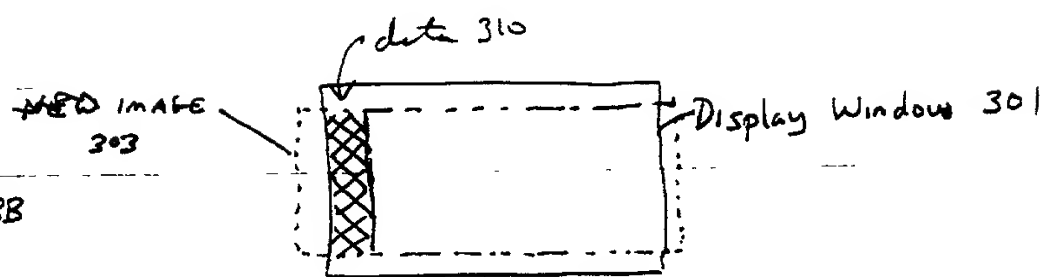


Figure 3c

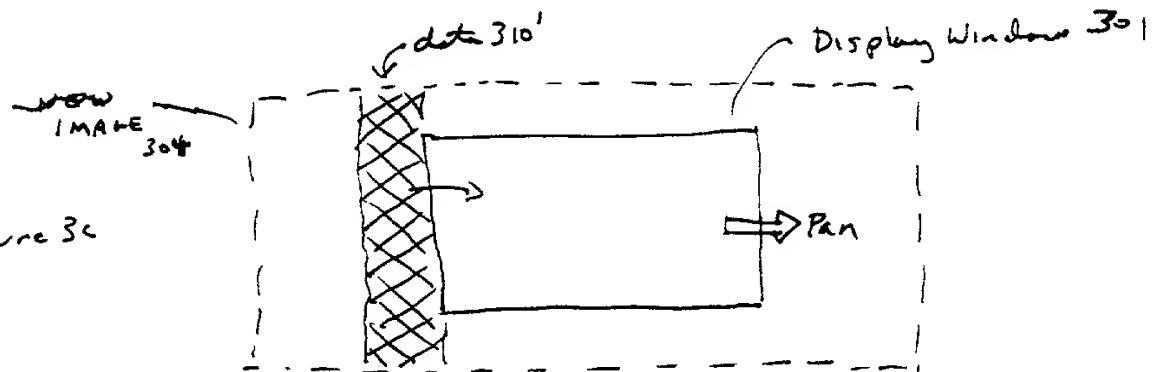


Figure 3

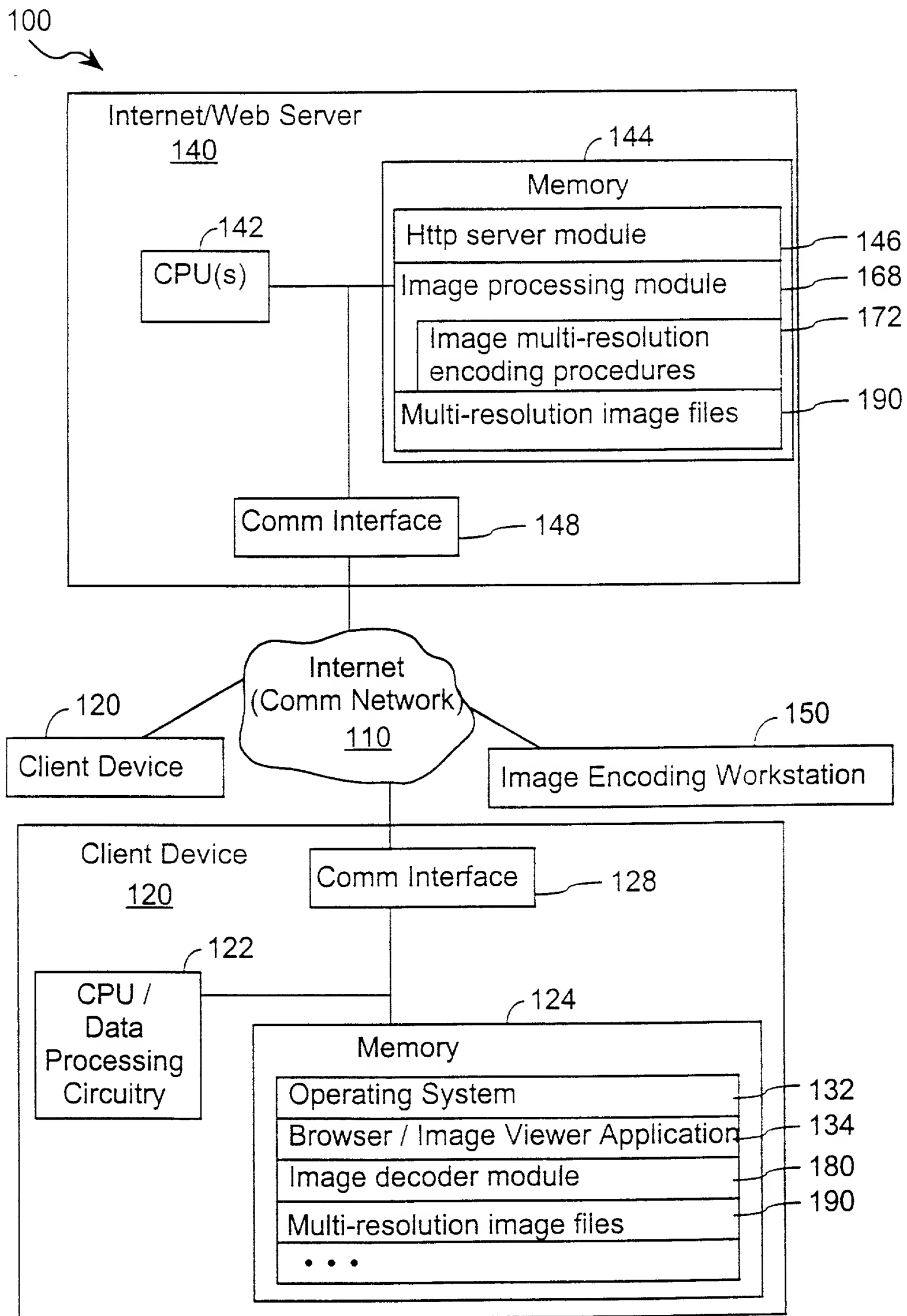


FIG. 4

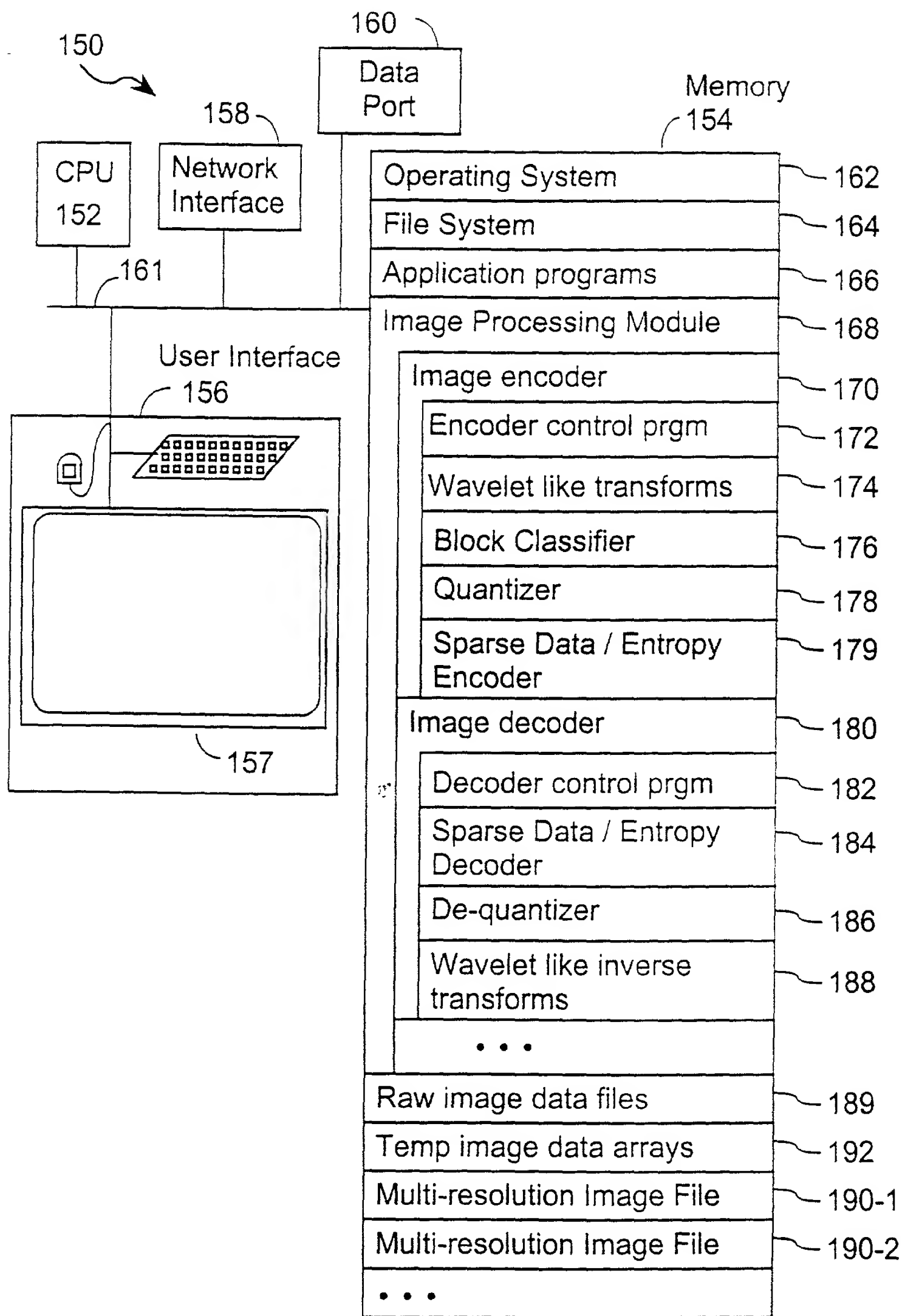


FIG. 5

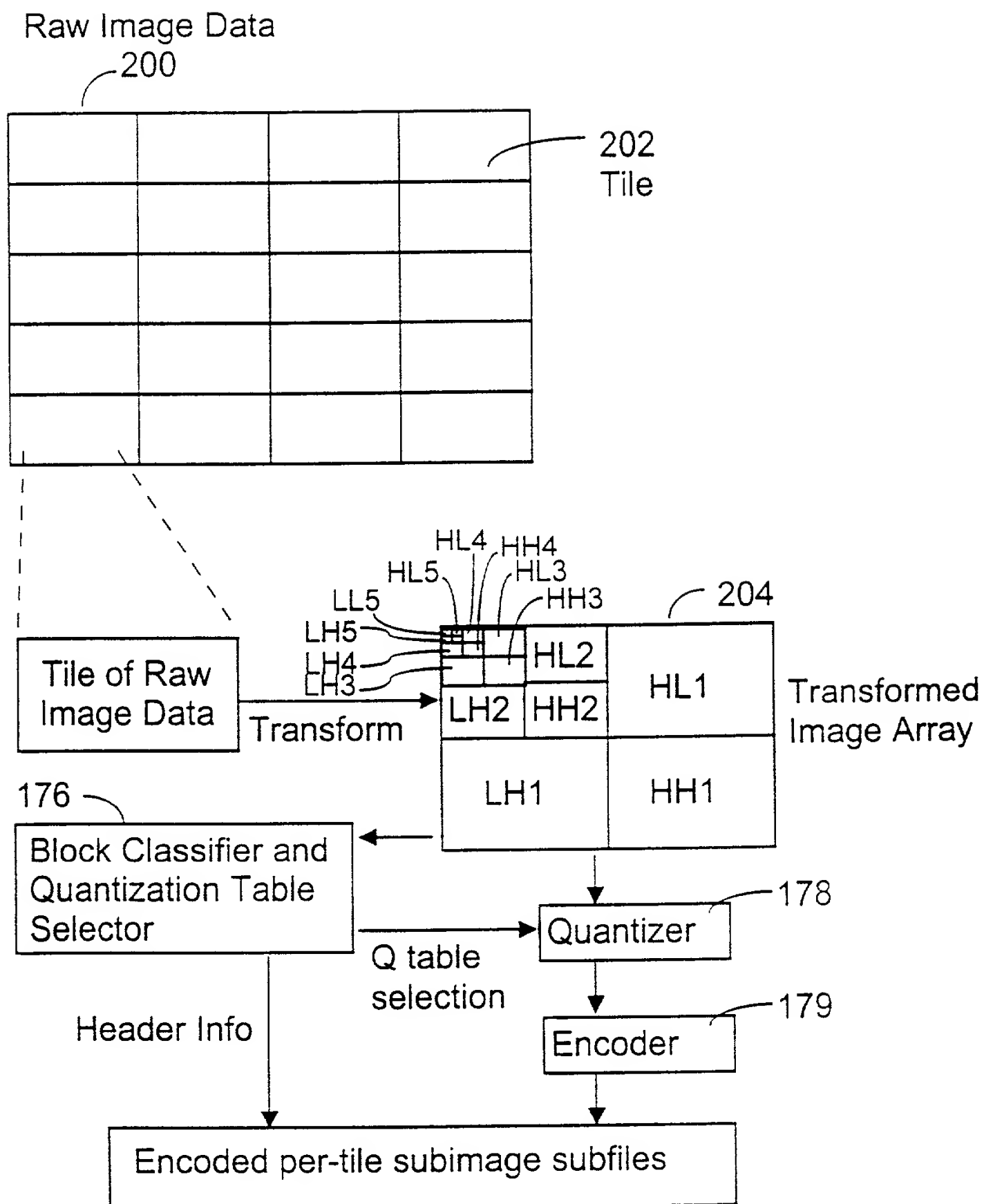


FIG. 6A

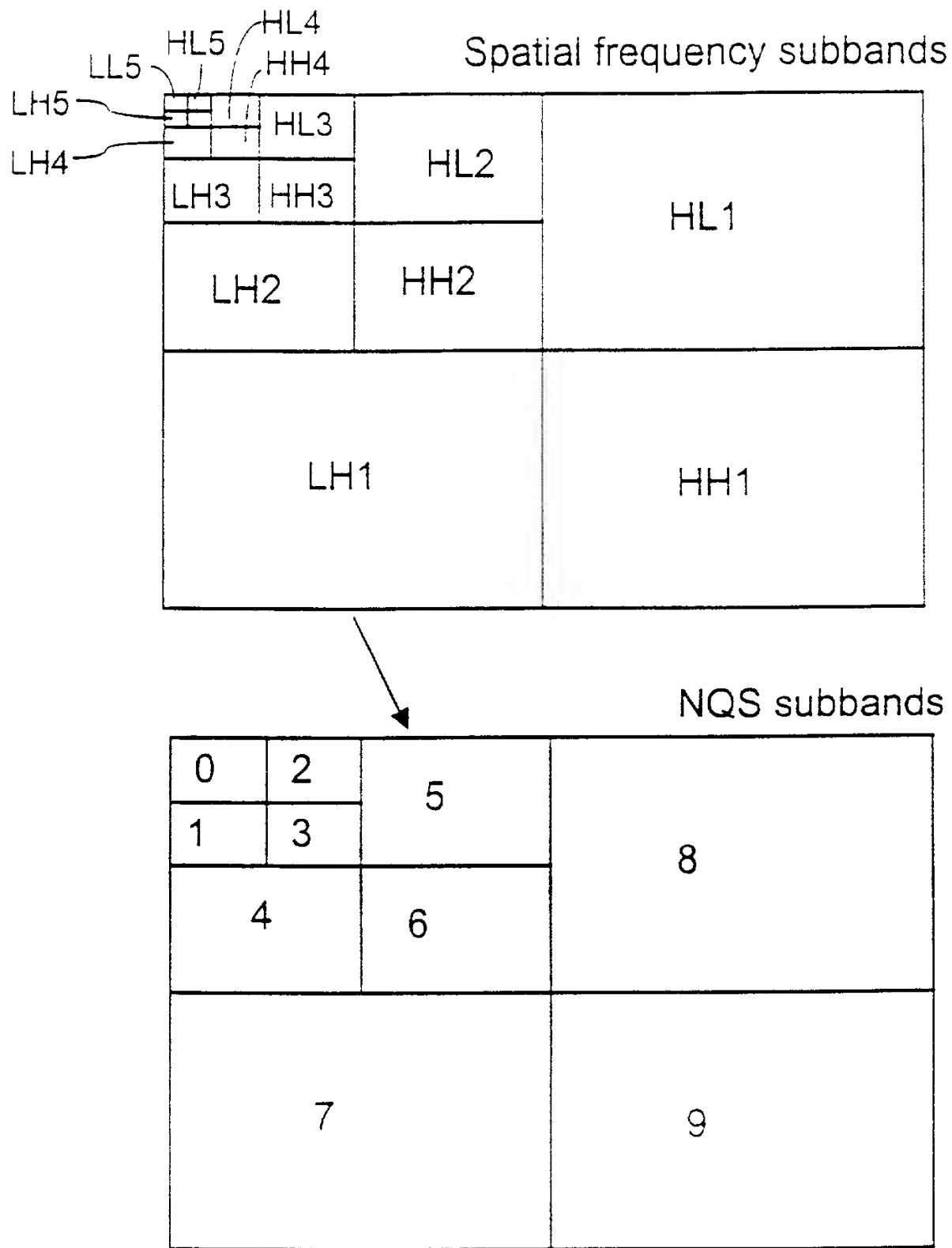


FIG. 6B

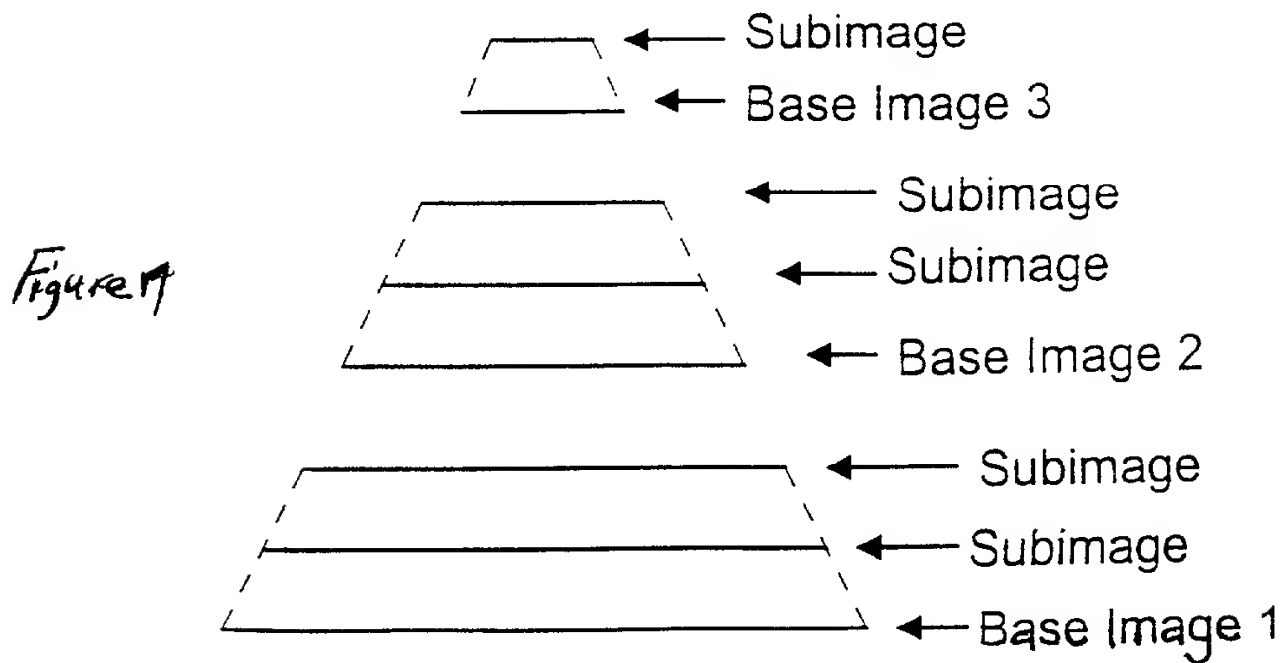


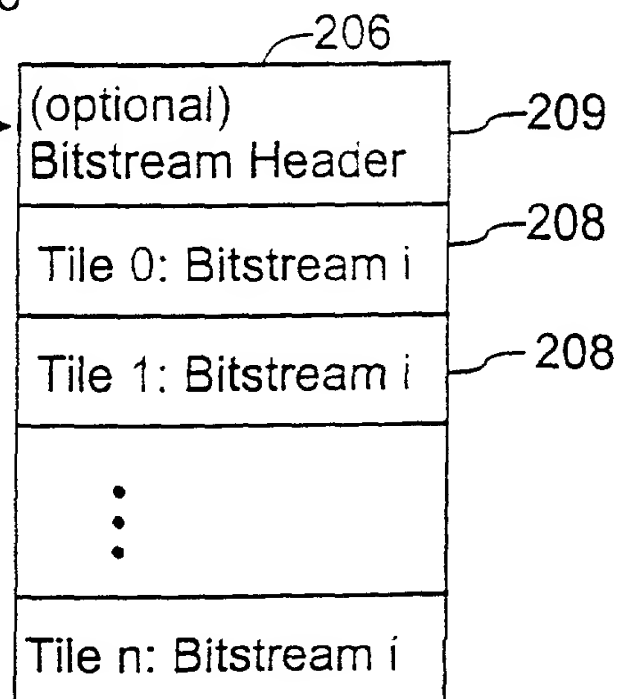
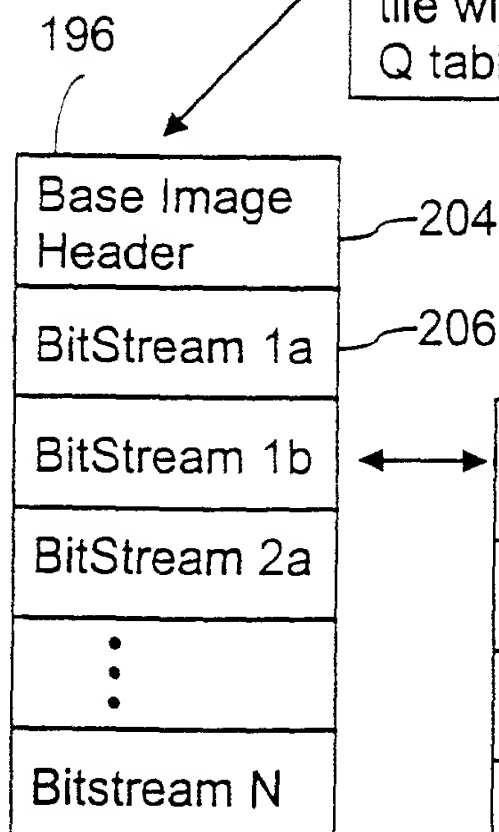
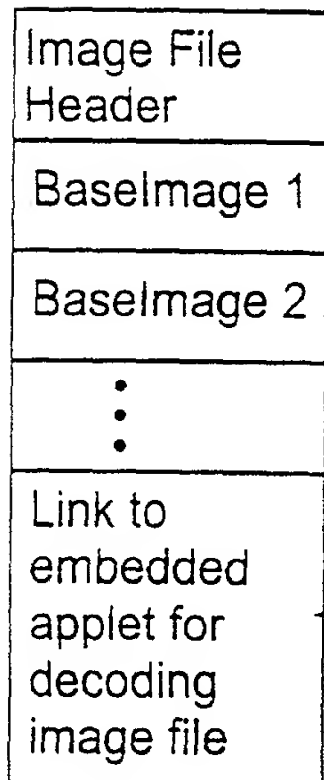
Figure 8A

Image File (Encoded
Image Data Structure)
190-A



ID or URL of Image file in server;
Number of base images;
Information for each base image:
Image size: X, Y;
Cropped Image boundaries
(for entire image and for
subimages).
Offset pointer to base image in
image file

Image Size: X, Y
Tile Size: X, Y
Color channel components
Transform filters used
Number of subbands (# of transform layers)
Number of bitstreams
Mapping of bitstreams to subimages
Information for each Bitstream: offset pointer to Bitstream; size of bitstream; range of subbands included in bitstream; # of color channels in bitstream; range of bitplanes included in bitstream for each subband within the bitstream; Table of offset pointers to each tile within the bitstream. Q table ID for each tile.



Java applet for
decoding image
file

FIG. 8A

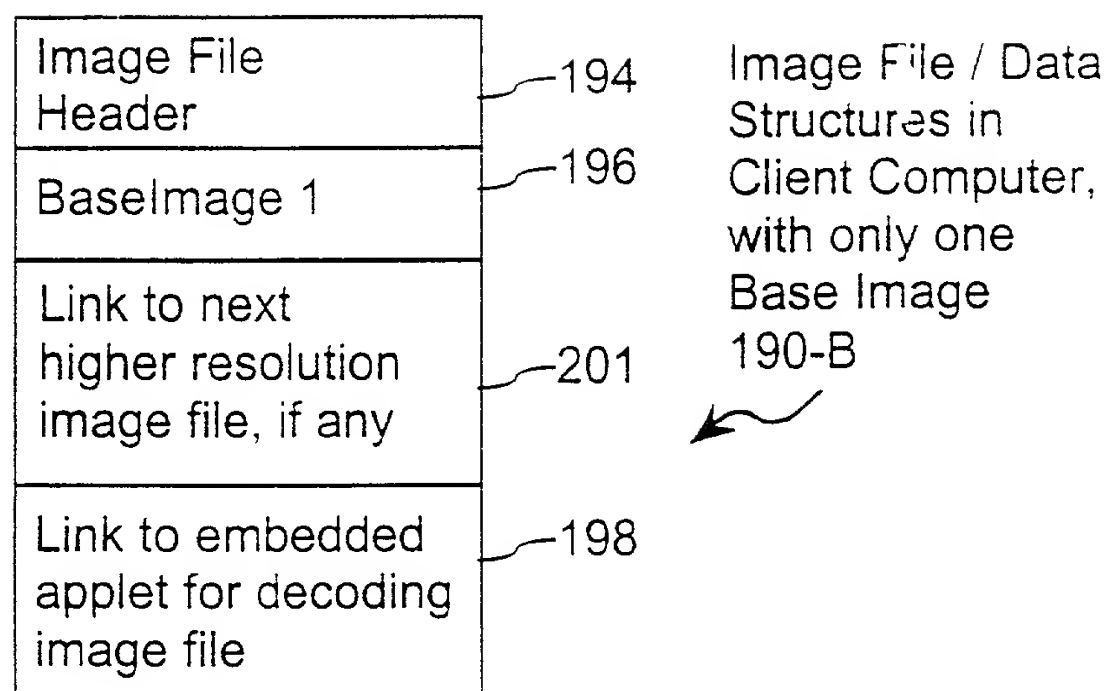


FIG. 8B

Image File (Encoded Image Data Structure) 190-C

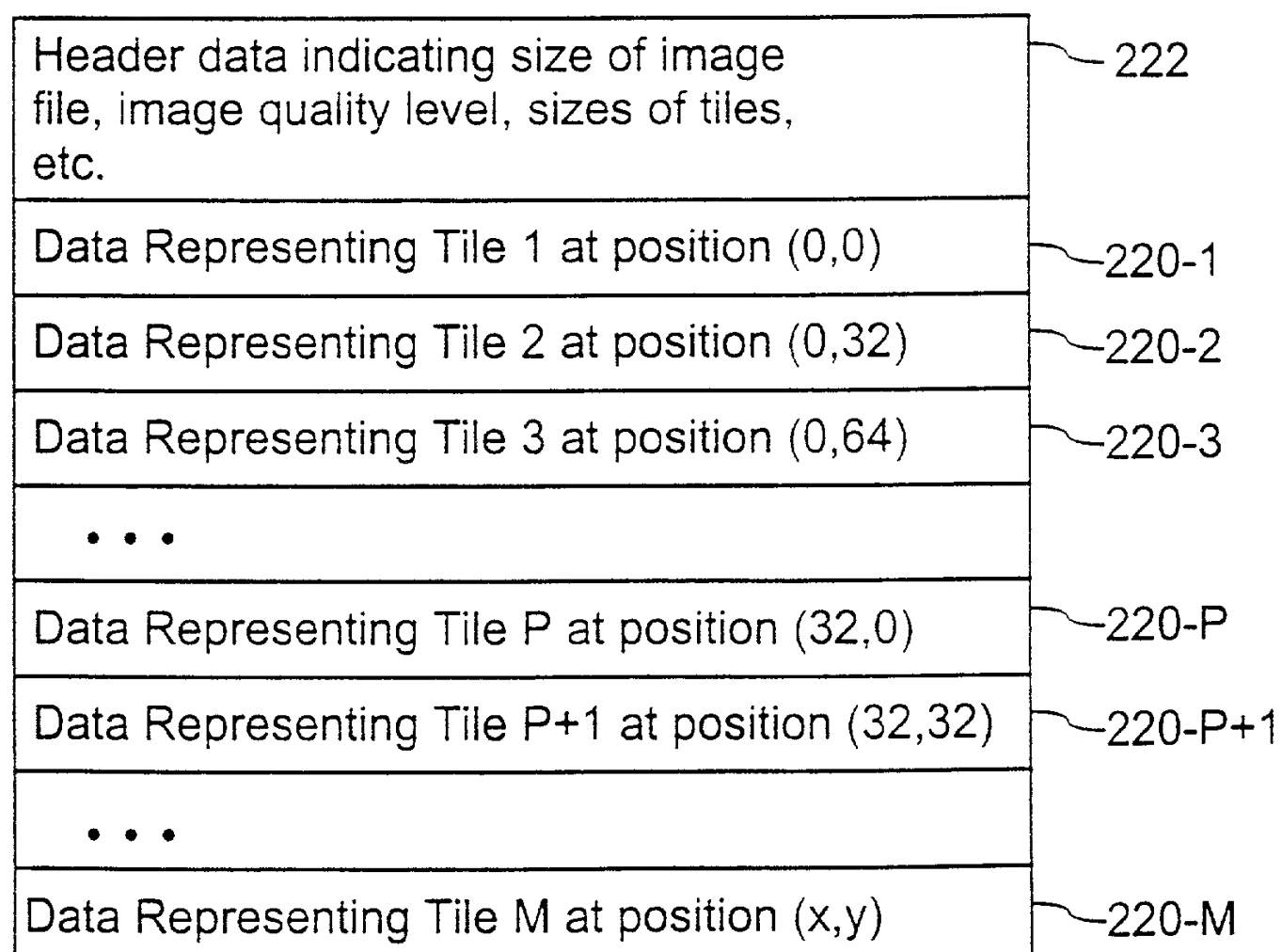


FIG. 8C

Data Representing One Tile t
220

Header Data: offset pointers to bitstreams, Q table ID, etc.	224
Bitstream 1a of Tile t: Significant part of LL ₅ , HL ₅ , LH ₅ and HH ₅ , through HL ₃ , LH ₃ and HH ₃ , with LL ₅ , HL ₅ , LH ₅ and HH ₅ , encoded as a single NQS block	226-1a
Bitstream 1b of Tile t: Mid-Significant part of LL _N through HL ₃ , LH ₃ and HH ₃ .	226-1b
Bitstream 2a of Tile t: Significant parts of HL ₂ , LH ₂ and HH ₂	226-2a
Bitstream 1c of Tile t: Insignificant part of LL _N through HL ₃ , LH ₃ and HH ₃ .	226-1c
Bitstream 2b of Tile t: Insignificant parts of HL ₂ , LH ₂ and HH ₂	226-2b
Bitstream 3 of Tile t: HL ₁ , LH ₁ and HH ₁ (all bitplanes)	226-3

FIG. 8D

Data Representing One Base Image + 2 Subimages
196A

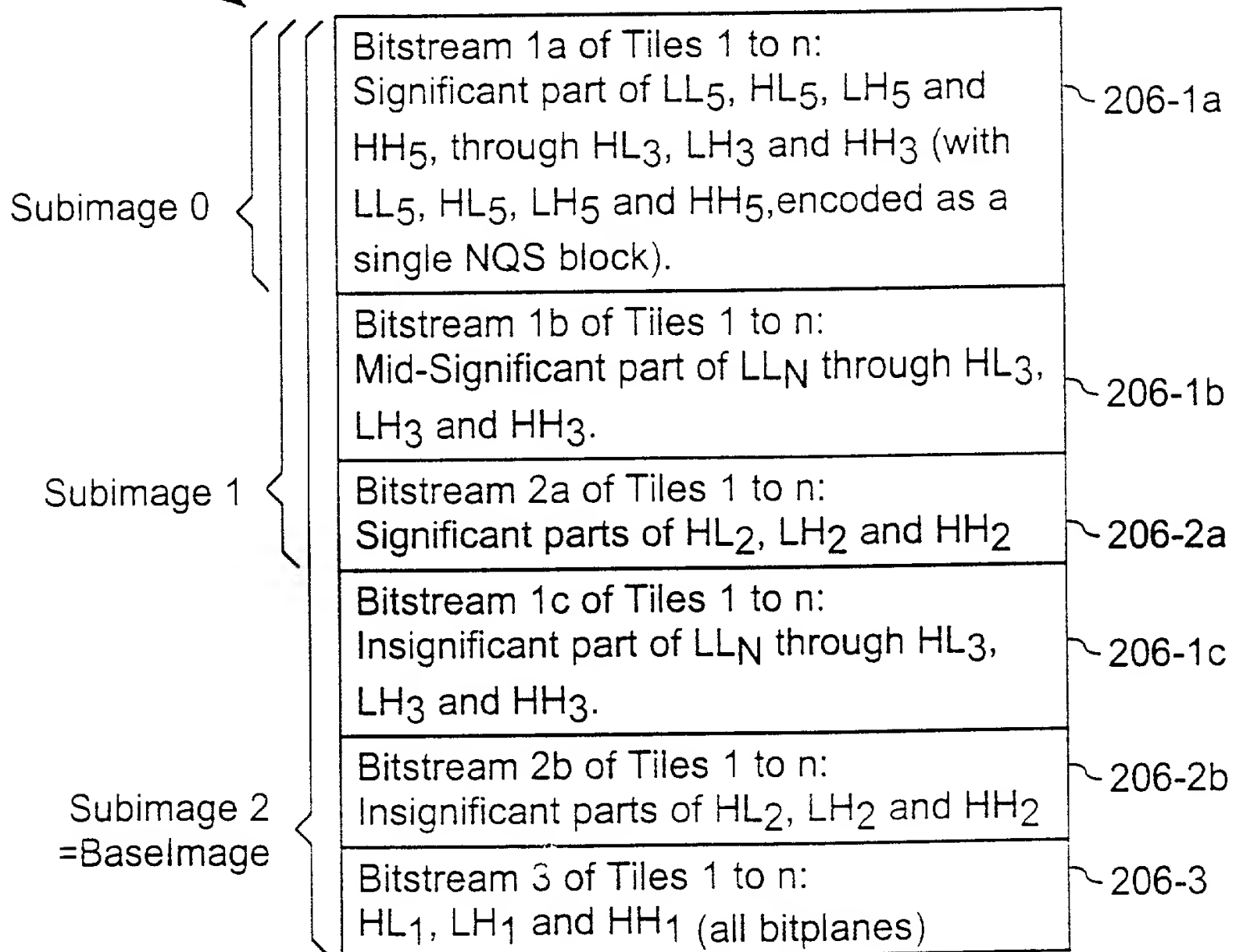


FIG. 8E

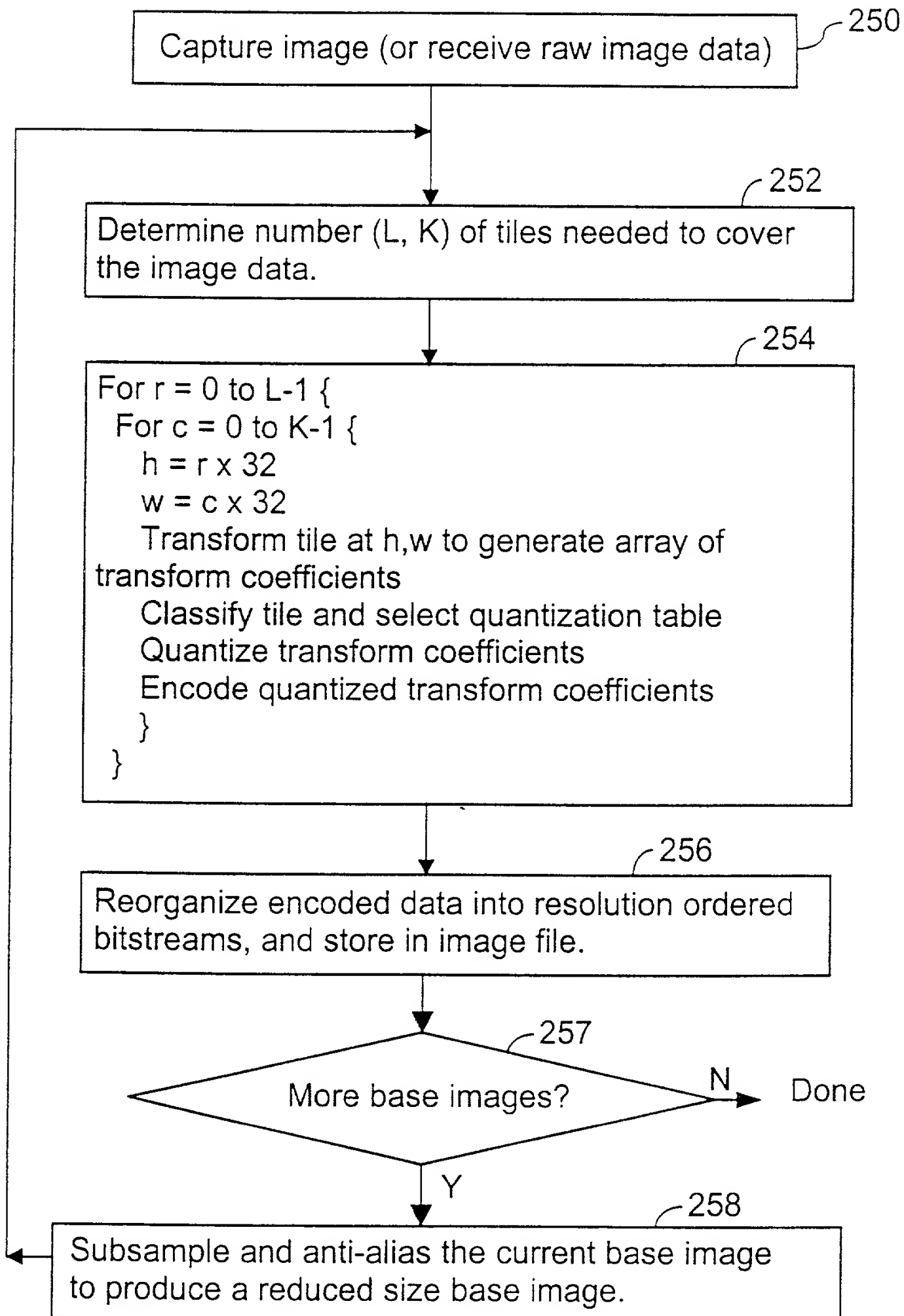
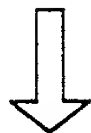


FIG. 9

Forward Transform



$[X_0, X_1, \dots, X_{2n-1}]$



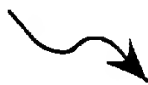
$[L_0, L_1, \dots, L_{n-1}; H_0, H_1, \dots, H_{n-1}]$

FIG. 10A

X_0	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}
Y_0		Y_1		Y_2		Y_3		Y_4		Y_5		Y_6		Y_7	
L_0		L_1		L_2		L_3		L_4		L_5		L_6		L_7	
H_0		H_1		H_2		H_3		H_4		H_5		H_6		H_7	

FIG. 10B

Inverse Transform



$[L_0, L_1, \dots, L_{n-1}; H_0, H_1, \dots, H_{n-1}]$



$[X_0, X_1, \dots, X_{2n-1}]$

FIG. 10C

	$u_{ij}^{(3)}$ HL ₃	$u_{ij}^{(2)}$ HL ₂	$u_{ij}^{(1)}$ HL ₁
$v_{ij}^{(3)}$ LH ₃	$w_{ij}^{(3)}$ HH ₃		
$v_{ij}^{(2)}$ LH ₂	$w_{ij}^{(2)}$ HH ₂		
$v_{ij}^{(1)}$ LH ₁		$w_{ij}^{(1)}$ HH ₁	

FIG. 11

Encode Image Procedure (Tile t):

Repeat for each NQS subband

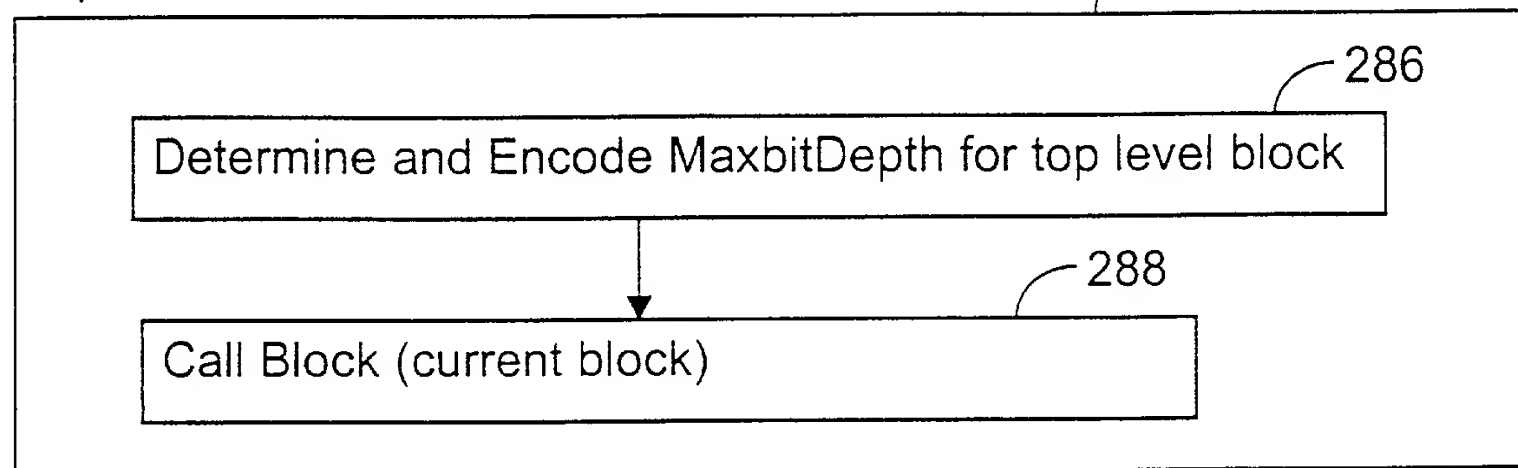
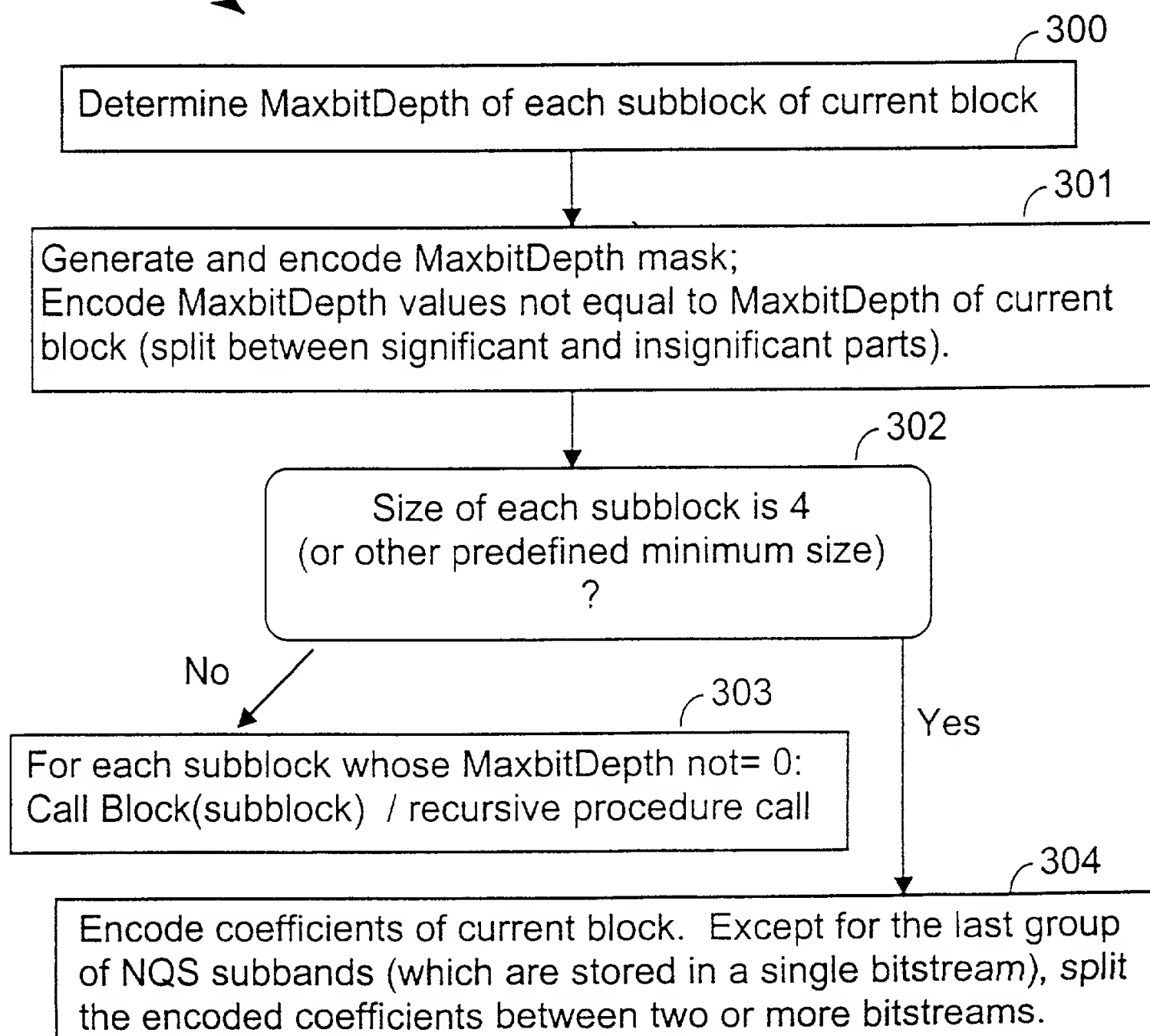


FIG. 13A

Block Procedure:

Fig 13B



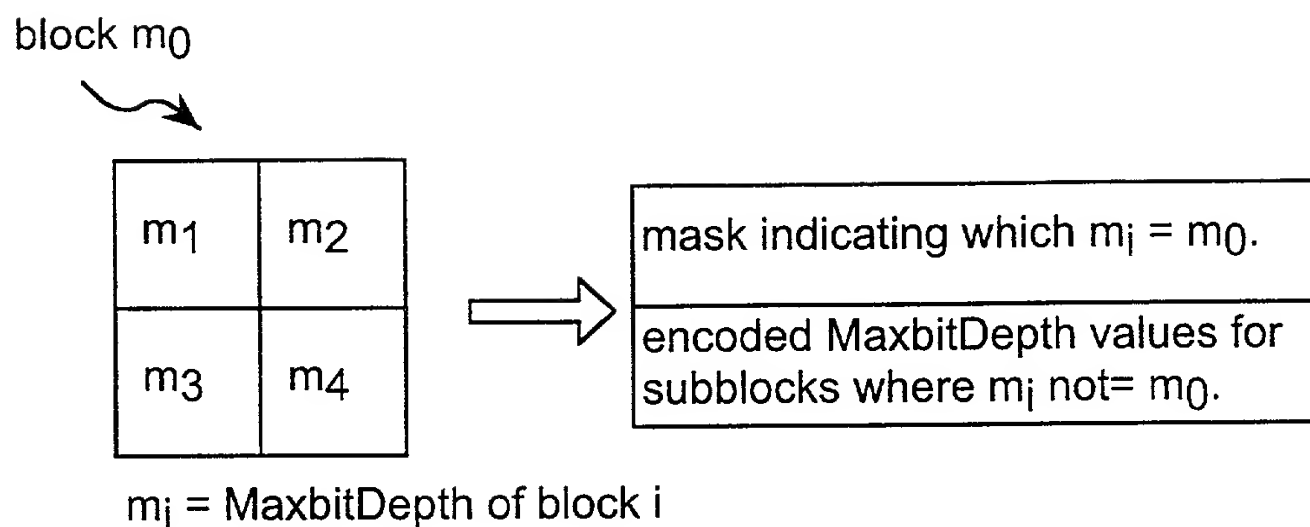


FIG. 14 A

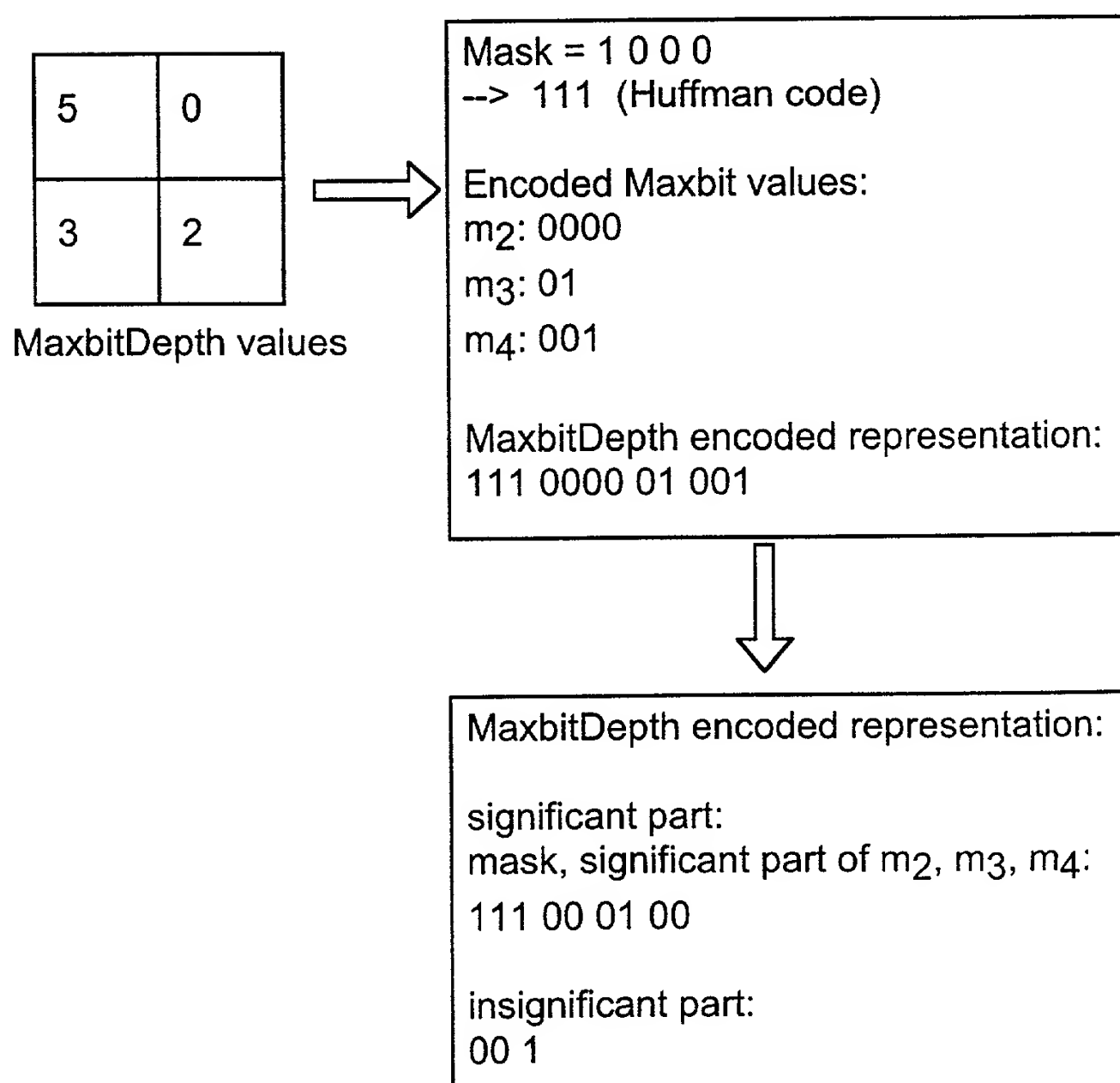


FIG. 14 B

Block Classifier and
Quantization Table
Selector

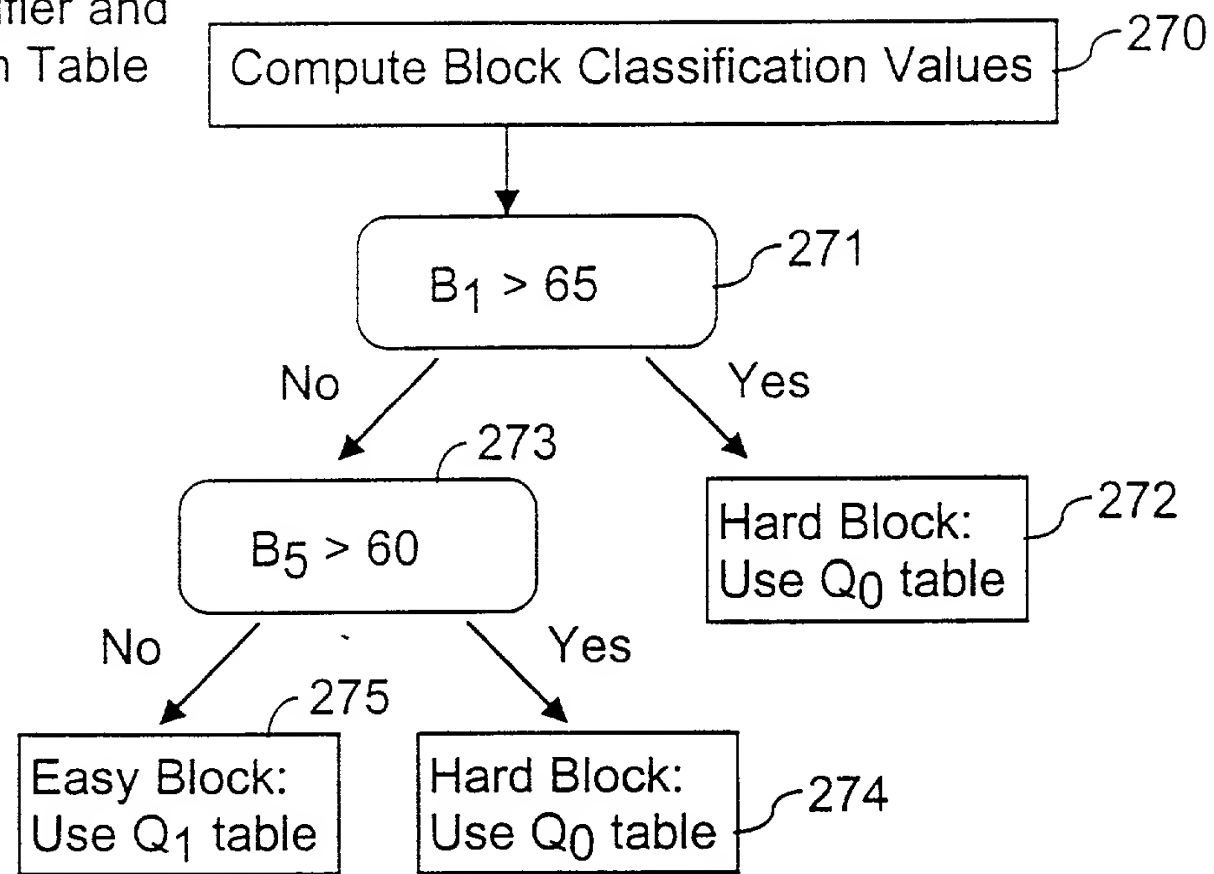


FIG. 12

Example

Encoding of Coefficients: 31, 0, -5, -2

significant part (threshold=3 bits):
POS 1, NEG

insignificant part:
111, 01, NEG 0

(MSB of each coefficient is known from MaxbitDepth values)

FIG. 14 C

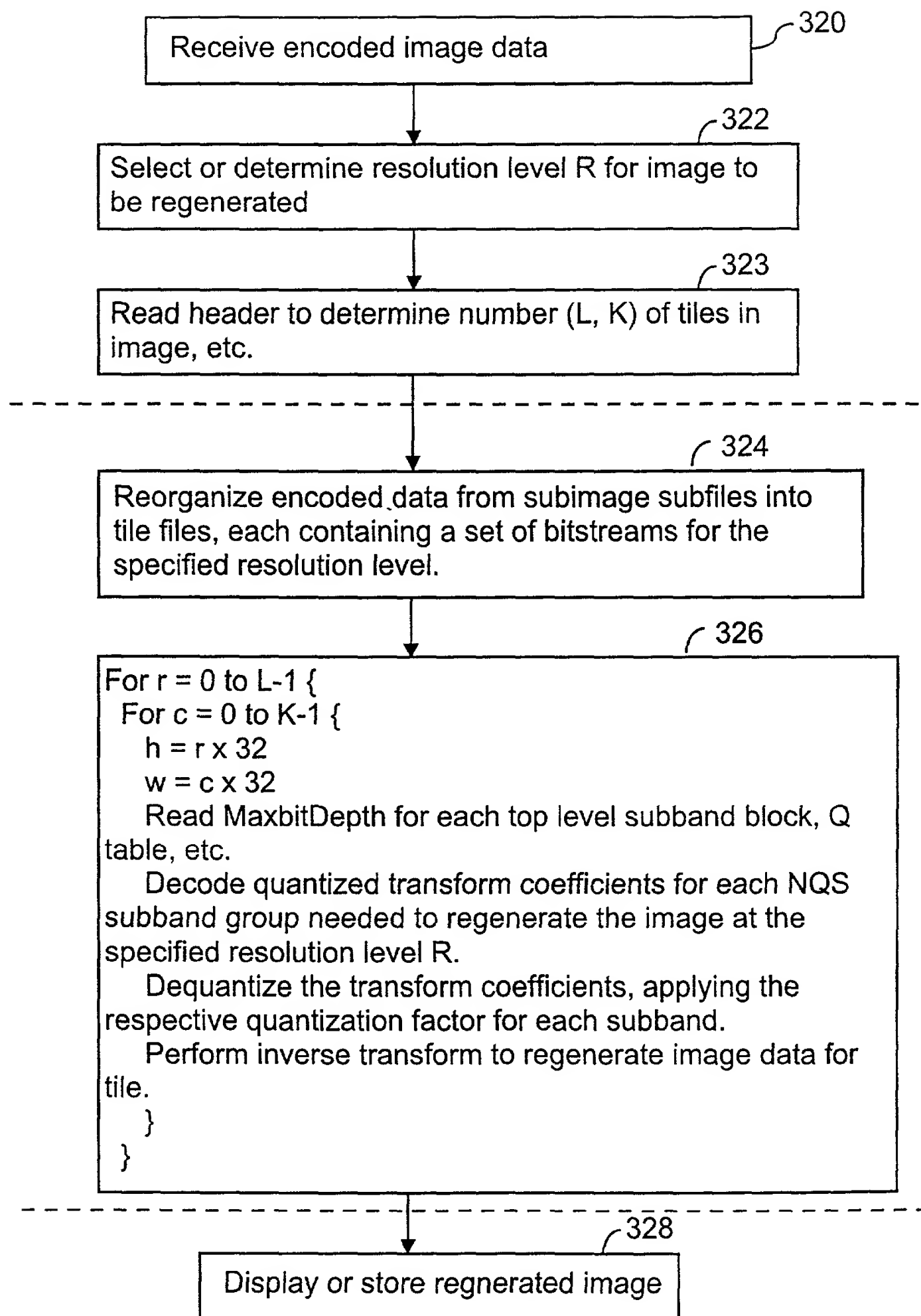


FIG. 15

Decode Image Procedure (Tile t):

Repeat for each NQS subband

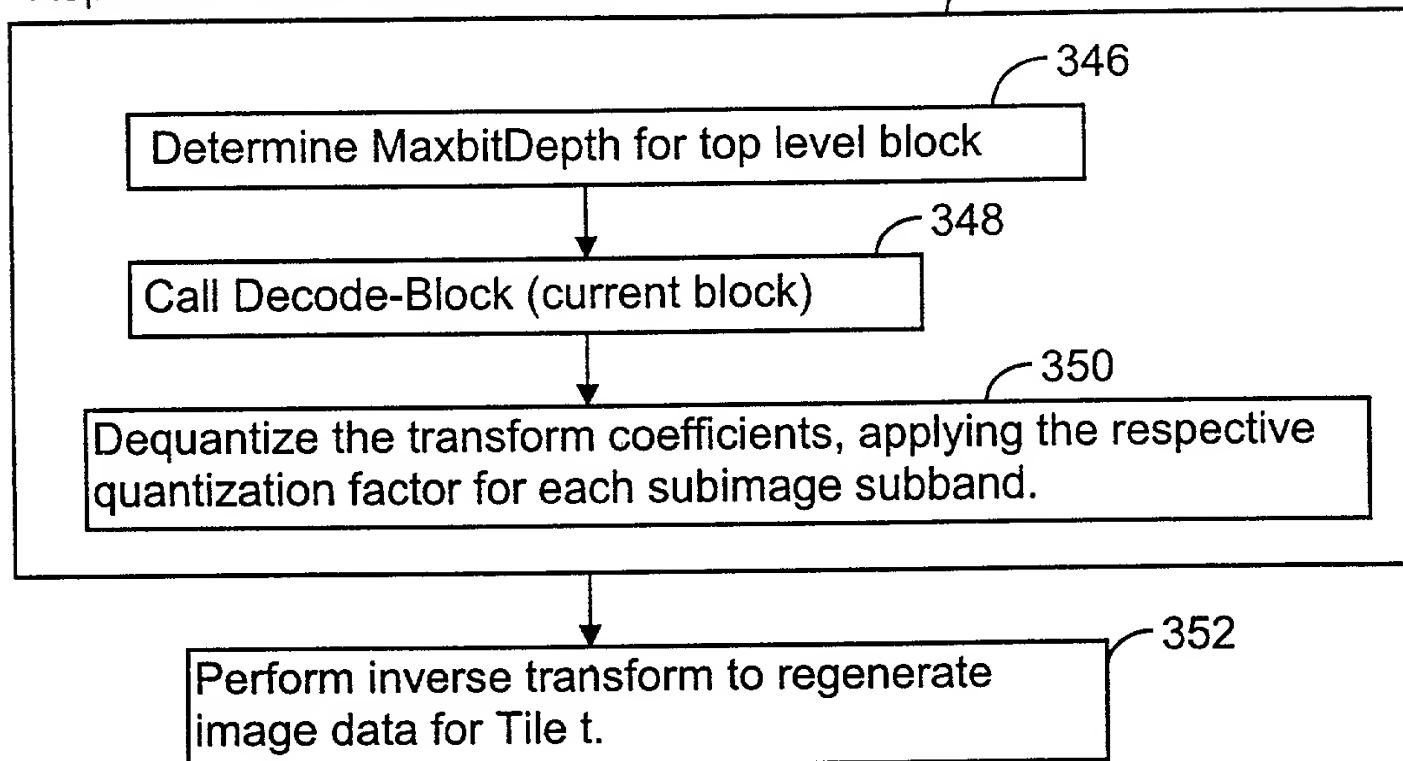


FIG. 16A

Decode-Block Procedure:

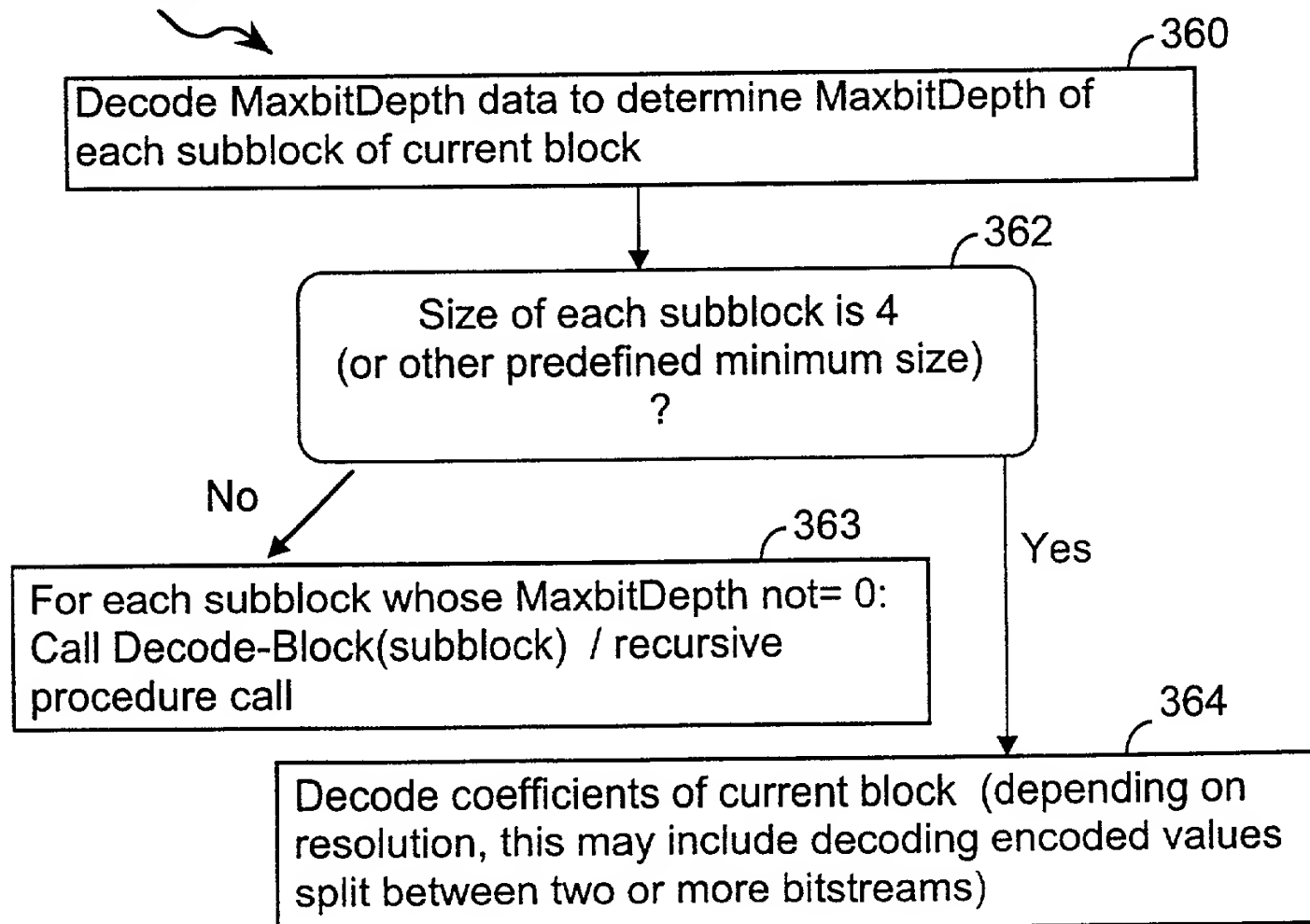


FIG. 16B

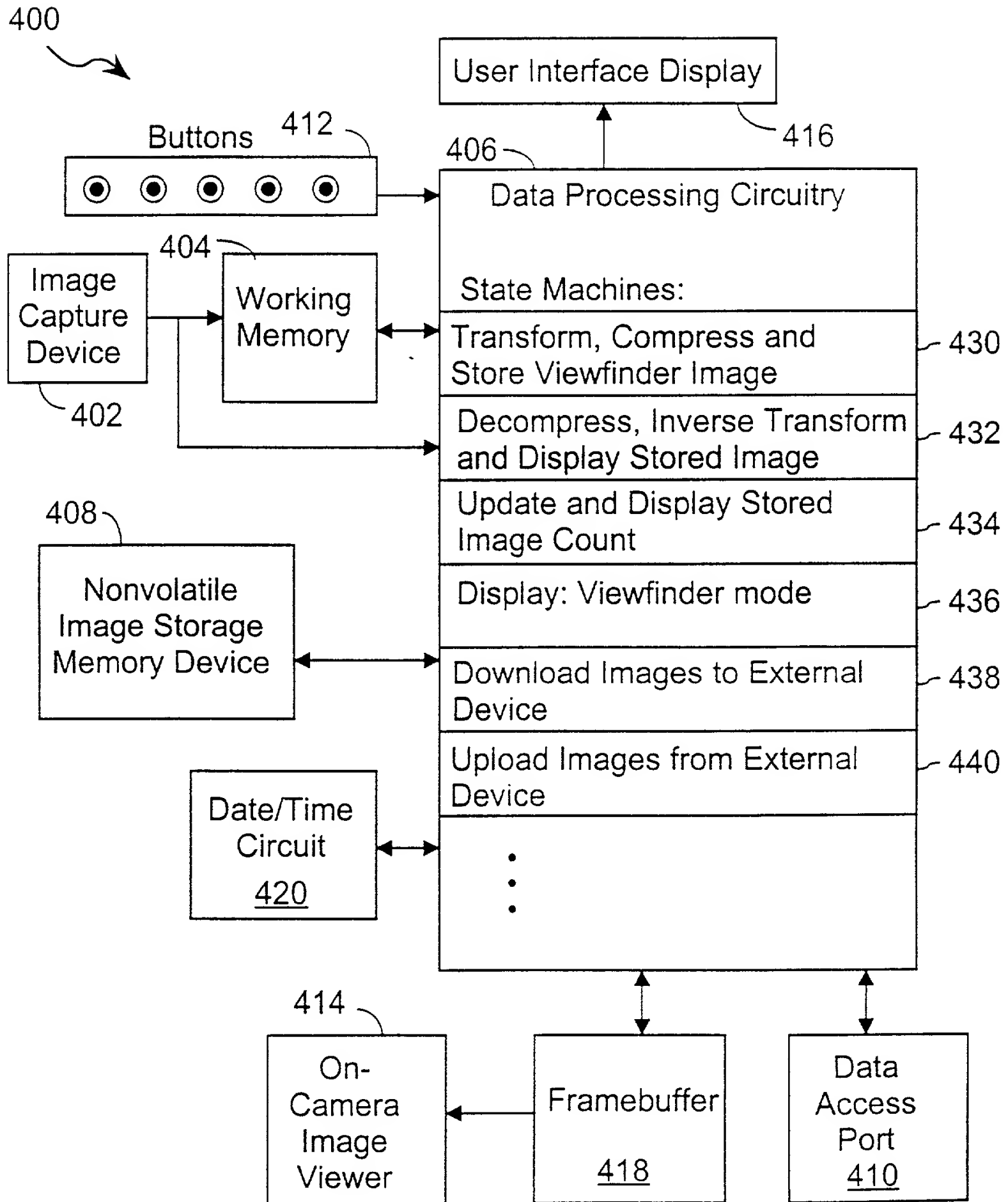


FIG. 17

Client Image Download, followed by Zoom and then Pan

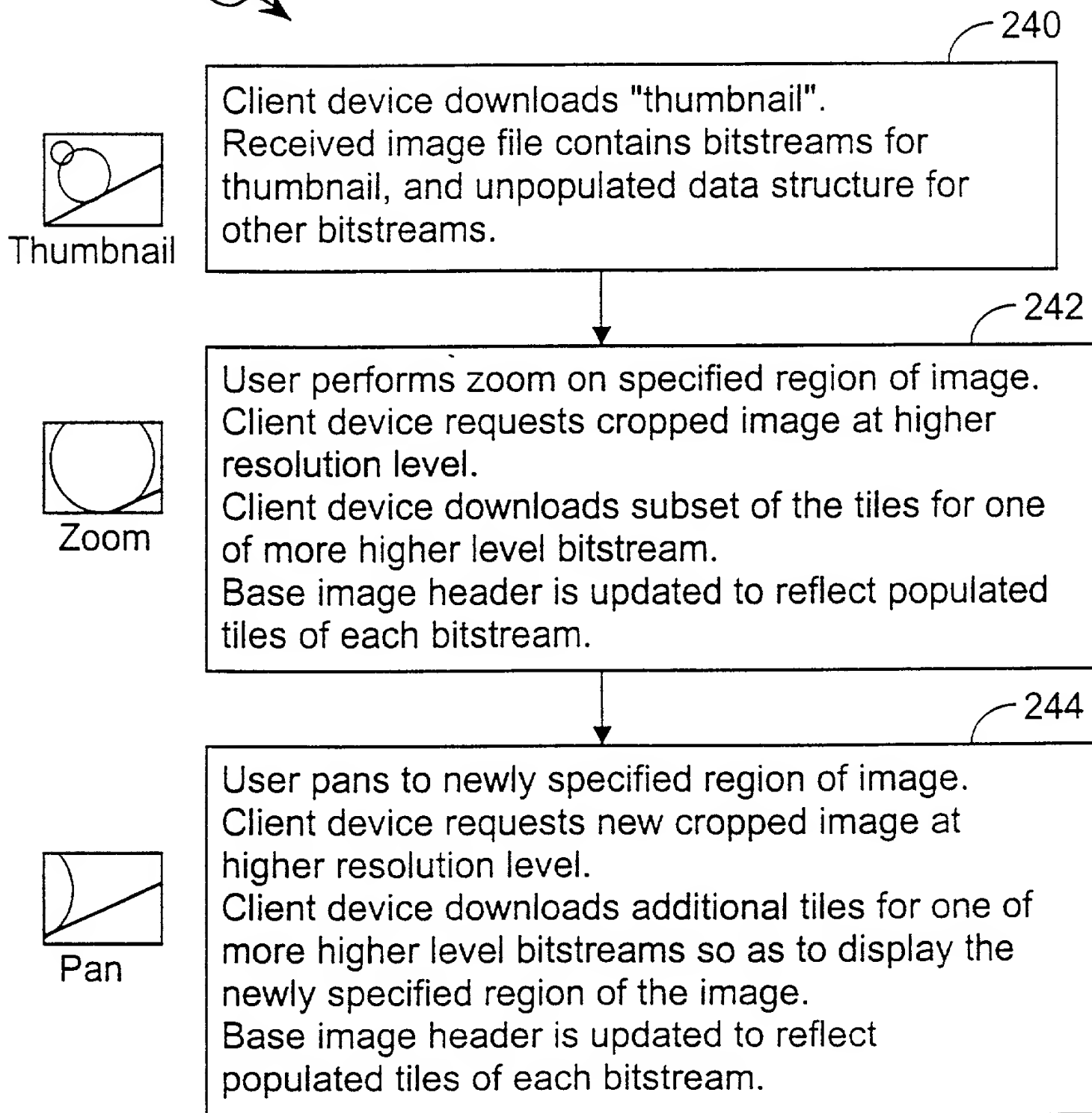


FIG. 18